

Clarifications and Changes to Chapter 1

There are no changes to this chapter.

Clarifications and Changes to Chapter 2

1. Page 34 and 35, the text has been revised to read:

2.4.3 Preferred Restoration Alternative (Proposed Action)

The Preferred Restoration Alternative would restore the entire 1,525-acre Cullinan Ranch Site. Under the Preferred Restoration Alternative, restoration would occur through the process of natural sedimentation with some on-site and off-site material used for ditch blocking and levee work. If additional clean, off-site *fill* or dredged material became available, it could be used to create islands, fill in ditches and toe drains, or raise the general elevation within Cullinan Ranch. *Levee lowering, construction of the buttress levee, and contouring of borrow soils to broaden areas closest to Guadalcanal Village would be used to produce a minimum of 30 acres at marsh plain elevations adjacent to a source population at Guadalcanal Village. Use of clean sediments from dredging activities as well as clean soils from other construction activities will be actively sought as fill for the Cullinan restoration project prior to breaching to produce up to 50 additional acres of tidal marsh habitat if additional import material is available and budget allows.* Under this alternative, up to four breaches would be constructed between Cullinan Ranch and Dutchman and South Sloughs (Figure 2-2) and one between Cullinan Ranch and Guadalcanal Village. The invert of the breaches would conform to the existing invert and thalweg of Dutchman South. This elevation would be carried through the levee footprint, then transition to the existing grade within Cullinan Ranch. Material from the breach construction would be placed on the interior levee slope.

The anticipated immediate habitat type (5 to 10 years) that will result from the Preferred Restoration Alternative will be that of a minimum 30 acres of tidal marsh habitat adjacent to Guadalcanal Village with additional non-contiguous tidal marsh habitat of approximately 40 acres along Dutchman Slough where levee lowering activities will occur. This acreage will be adjacent to intertidal mudflats and open water that will persist for a period of 10 to 50 years into the future as sediments are naturally deposited into the site, channels form, and marsh plain is reached. Some areas that are more deeply excavated for channels and deep pools are intended to be self-sustaining by the daily tidal prism and remain open. If these channel or pools sediment in, no dredging will be conducted. Anticipated wildlife use within the first 10 years would include salt marsh harvest mouse, clapper rail, black rail, and other tidal marsh dependent species. Deep water areas will accommodate diving and some puddle ducks. Areas between the tidal marsh zone and deeper water will accommodate shore and water birds during low tide events.

Surveys to determine presence or absence of special status plant species will be conducted prior to construction activities and special status plant species, if located, will be salvaged and propagated at the refuge native plant nursery. These plants will be re-introduced to the site or other sites on the Refuge at a later time.

2. Page 35, the text has been revised to read:

The Preferred Restoration Alternative would include implementation of the following project components:

- Component 1 – ~~Construct boardwalk to provide access to existing electrical towers~~ ~~Block drainage ditches to promote redevelopment of the natural sloughs~~
- Component 2 – ~~Block drainage ditches to promote redevelopment of the natural sloughs~~
~~Construct boardwalk to provide access to existing electrical towers~~
- Component 3 – Improve the Pond 1 levee and install water control structures
- Component 4 – Protect Highway 37 from flooding and erosion
- Component 5 – Construct public access areas
- Component 6 – Pre-flood Cullinan Ranch Site prior to breach of levees
- Component 7 – Breach the levees along Dutchman and South Sloughs and Guadalcanal Village
- Component 8 – Long-term monitoring

Immediately prior to levee breach construction, the Cullinan Ranch Site would be slowly flooded to allow the dissemination of non-avian wildlife species to other areas. The water control structures installed in the Pond 1 levee will be instrumental to this phase of restoration. Sections of the Cullinan Ranch levee would be lowered to within tidal range for habitat improvements during this time. Breach construction would be initiated at the west end of the site. Breach locations will be as close to historic channels as practicable. The placement of these breaches would increase the capacity of South Slough over time. This would result in South Slough conveying a larger percentage of the tidal prism into Cullinan Ranch and would reduce physical effects to Dutchman Slough and Pritchett Marsh. The size of the breaches would initially result in a muted tidal prism within Cullinan Ranch. This would result in lower tidal velocities, which in turn would reduce the adverse impacts to the adjacent slough system. Over time the breaches would erode as the system came into equilibrium. The existing Pond 1 levee would be reinforced and raised where necessary. The borrow ditch adjacent to the Pond 1 levee on the Cullinan Ranch Site would be filled. Two water control structures would be installed in the Pond 1 levee to provide pre-breach flood water and circulation between Pond 1 and Cullinan Ranch. A new channel would be constructed in Pond 1. Material generated by the channel construction would be utilized on the Cullinan Ranch Site. A public access platform would be constructed adjacent to the Pond 1 levee and a kayak launch installed. A deepwater channel would be constructed to connect the ramp to natural slough channels. Intertidal benches would be constructed at the public access point to encourage the development of pickleweed and provide interpretation opportunities. The toe drain adjacent to the Highway 37 embankment would be filled to match adjacent ground elevations. A buttress levee would be constructed adjacent to a portion of Highway 37 where the highway would need protection from tidal fluctuations. *The buttress levee would also prevent storm water runoff from escaping the road shoulder so a grassy swale will be incorporated into the design to convey runoff away from the road. A Stormwater Pollution Prevention Plan (SWPPP) will be developed for restoration construction activities and will include BMPs to control construction-related runoff and prevent any discharges to surrounding water* The levee would be constructed with a top elevation of 9.0 feet and have a 5:1 horizontal to vertical slope from 9.0 feet to 8.0 feet, after which it would transition to a 10:1 slope. Pickleweed would be collected from the toe drain, stockpiled and planted on the new levee slope prior to construction, if practicable. The remainder of the highway's shoreline would be armored *with riprap* to protect the levee from wind-generated erosion. *Riprap between MHHW (approximately 3.7 feet NGVD 1929) and the top of the riprap (7 feet NGVD 1929) on the existing Highway 37 levee will be filled using local borrow. Salt-tolerant native grasses will*

be planted in the fill, where appropriate. The intent of the grass cover is to minimize infestation by non-native or invasive plant species. Both the Solano and Napa Mosquito Abatement Districts (MADs) would be consulted during design, construction, and operation regarding mosquito abatement control measures. The following discussion describes the major components of the Preferred Restoration Alternative.

3. Page 39, Figure 2-2 has been revised and the revised figure is below.

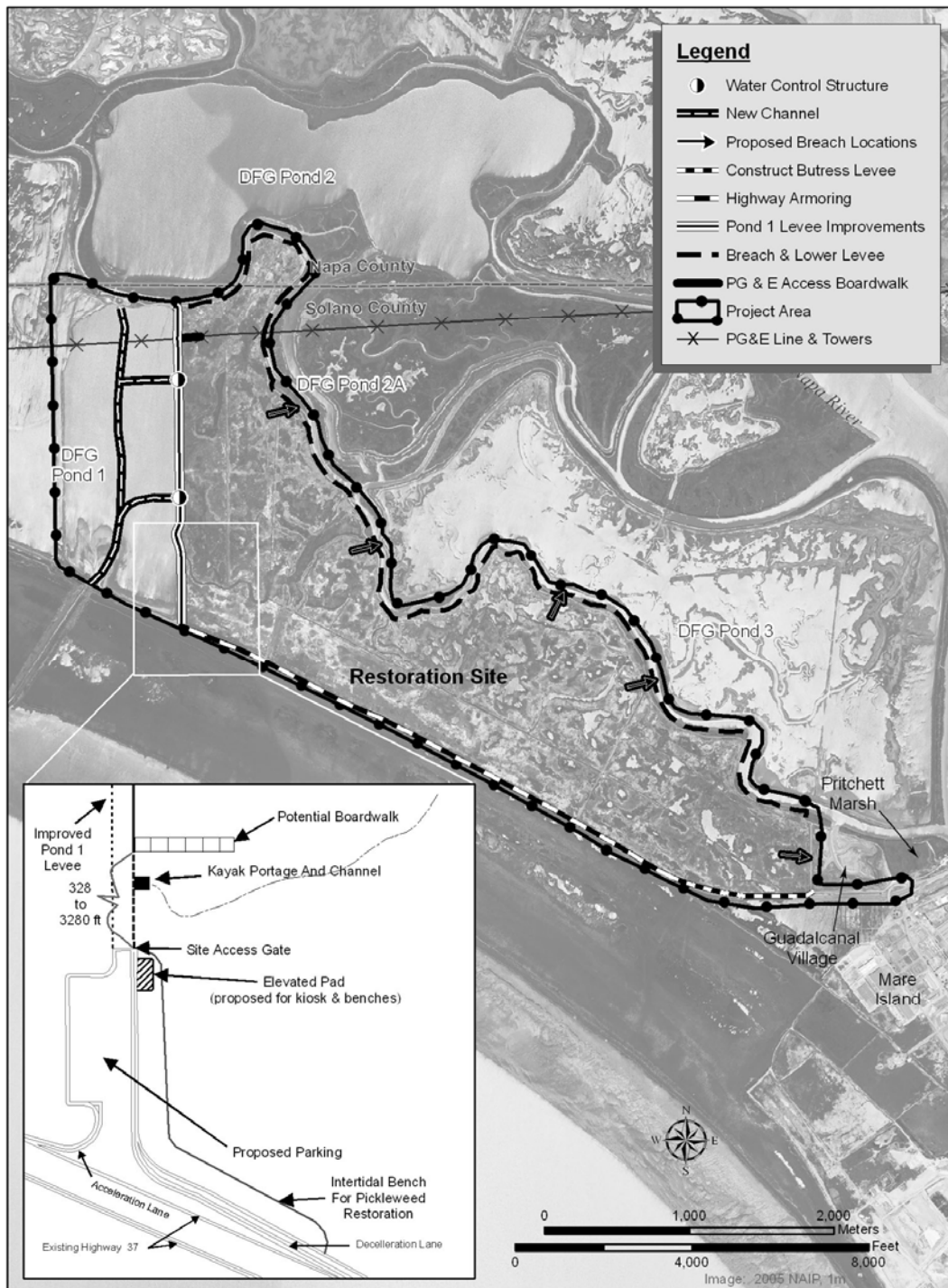


Figure 2-2. Preferred Restoration Alternative

4. Page 45, the Preferred Restoration Alternative, the text has been revised to read:

Component 4 – Protect Highway 37 from Flooding and Erosion

California State Route 37 is an elevated two-lane roadway located on an embankment that forms the southern boundary of the Cullinan Ranch Site. This embankment is essentially a flood control levee that protects the roadway, Cullinan Ranch, and adjacent northern properties from tidal flooding and wave action from San Pablo Bay to the South. Within the boundaries of the Cullinan Ranch Site, the Highway 37 embankment at the edge of pavement ranges in elevation from four to eleven feet (NGVD 1929). Hydrologic studies conducted by Moffat & Nichol Engineers determined that if the Cullinan Ranch Site was restored without adequately elevating and protecting the embankment, it is likely that the eastern portion of Highway 37 would be flooded during combined high tide and storm events. The studies determined that a levee height of 8.0' NGVD would be sufficient to protect the eastern portion of the highway from extreme tidal events (Moffat & Nichol 2002). In addition to flooding, inadequate protection of the Highway 37 levee from wind-induced waves from within the Cullinan Ranch Site could also result in significant erosion of the highway embankment. To minimize these potential effects, a buttress levee would be constructed against the existing embankment along an approximate 3,500-foot section of Highway 37 where the edge of the pavement could potentially be overtopped. Based upon real-world experience at the Guadalcanal Village restoration site Caltrans has requested that the buttress levee be constructed to an elevation of 9.0 feet (NGVD 1929) (Pers. Comm. Peterson 2007). *If practical, pickleweed would be collected from the toe drain prior to levee construction, stockpiled, and planted on the finished slope.* Erosion protection, or armoring, would be constructed in place along the ~~entire remaining portion of the~~ three-mile section of the embankment that lies within the project boundary. The armoring may consist of, but is not limited to, placement of stone, flattening of levee slopes, and planting vegetation. ~~*If practical, pickleweed would be collected from the toe drain prior to levee construction, stockpiled, and planted on the finished slope.*~~ A layer of fill will be placed on any riprap between MHHW (approximately 3.7 feet NGVD 1929) and the top of the riprap (7 feet NGVD 1929), and salt-tolerant native grasses planted in the fill, where appropriate. The intent of the grass cover is to minimize infestation by non-native or invasive plant species. The detailed design of the Highway 37 reinforcement will include a literature search for existing geotechnical investigations and additional investigations performed as necessary to facilitate the design.

The existing drainage ditch that parallels the highway would be filled to match adjacent ground elevations. The buttress levee and armoring would be constructed on top of this fill. A grassy swale would be constructed between the existing highway embankment and the buttress levee to convey stormwater runoff from the highway (Figure 2-6). The water would drain eastward into a detention basin consisting of an abandoned ditch segment between Guadalcanal Village and Highway 37, where it would be held until it could drain into the Cullinan Ranch Site at low tide through tide gates. Alternatively, the stormwater could potentially be diverted into the existing drainage canals located near Guadalcanal Village and the Mare Island Bridge.

The buttress levee, riprap armoring, deceleration and acceleration lanes are all located within Caltrans' Right-of-Way. As a matter of public safety the design for these components will be closely coordinated with Caltrans. Construction-related vehicular routing would also be coordinated with Caltrans and other agencies as necessary. Design details, plans and other technical information will be submitted to Caltrans at appropriate design levels for their review and comment.

5. Page 46, the Preferred Restoration Alternative, the text is revised to read:

Component 5 – Construct Public Access Areas

Currently, the Pond 1 levee serves as a public access point to Cullinan Ranch. Under the Preferred Alternative, this access point will be improved (Figure 2-2). *Where necessary, public access levees would be raised to a minimum of 8.0 NGVD 1929. These levee elevations will be greater than or equal to surrounding properties. An existing graveled wide section of the Pond 1 levee located adjacent to Highway 37 serves as a parking area for recreation users. The parking area has already been improved by CDFG by relocating it further away from the highway, paving the surface, and providing room to accommodate approximately ten vehicles.* However, there are no ~~built roadways leading either off deceleration or acceleration lanes from~~ or onto Highway 37 in this area, and access to or from the highway can be hazardous. Paved acceleration and deceleration lanes will be installed on the north side of Highway 37 along the westbound lane, before and after the Pond 1 levee, to facilitate safe highway merging. Construction of the deceleration lane would necessitate the widening of the Highway 37 embankment along its path. Some re-contouring of the Pond 1 levee slope might be necessary but this is expected to be no more than 150 linear feet. Public use facilities such as a kayak launch, benches and interpretive signs would be placed within the Cullinan Ranch Site on a pad or platform adjacent to the parking lot. This pad would be constructed of on-site or imported fill material and would be located at the southwest corner of the property. Intertidal benches would be construction in this vicinity to facilitate pickleweed development and provide for interpretation opportunities. A pier would be constructed to facilitate angling and wildlife viewing.

6. Page 47, Figure 2-6 has been revised and the revised figure is below.

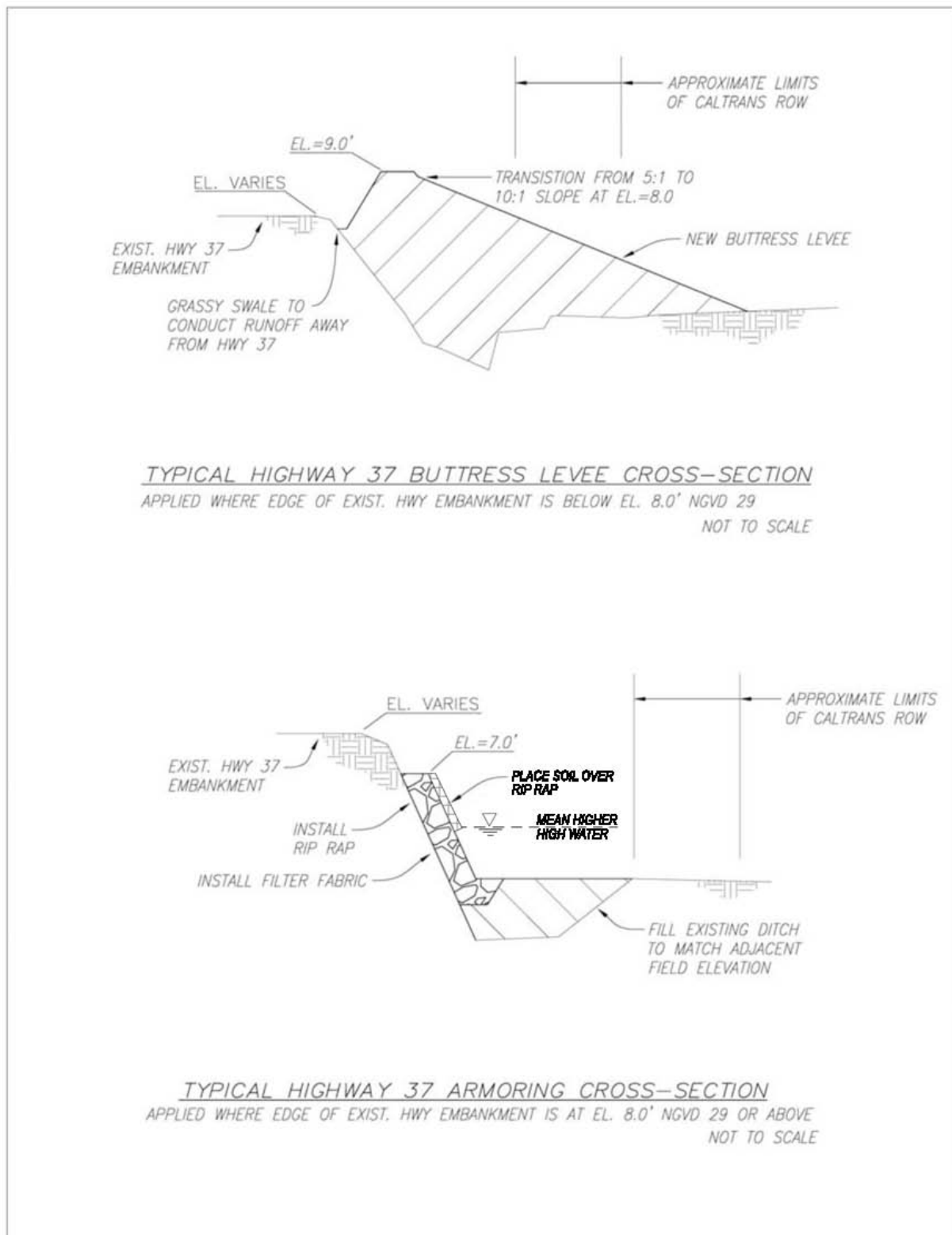


Figure 2.6. Proposed Highway 37 Improvements

7. Page 49, the text has been revised to read:

Component 6 – Pre-Flood Cullinan Ranch Site Prior to Breach of Levees

The 1,525 acre Site has laid fallow for over a decade, allowing upland vegetation and marsh habitats to form. Mammals, which have populated the Site will be displaced when tidal flow is restored. To allow movement of animals from the Site, Cullinan Ranch will be slowly flooded in midwinter using the water control structures installed in the Pond 1 levee, as described above in Component 3. During the winter, Cullinan Ranch will be partially flooded due to ponding of rainwater. Once the Site is fully flooded with a minimum of one-foot of water, the levee between Cullinan and the Dutchman and South Sloughs will be breached to accommodate tidal flows.

Existing vegetation would not be graded, grubbed, or disturbed beyond the areas of construction. The physical remains of the persistent above ground woody and fibrous vegetation should provide bed roughness to help dampen wave energy and facilitate sedimentation.

Anaerobic conditions may form during the flood up period depending on the length of time water is held in Cullinan Ranch prior to breaching. Water quality monitoring will be instituted when Cullinan is flooded to determine water quality and therefore the timing of breaches. Due to the increase in floodwaters from the Napa River and rainfall accumulation during winter periods, any discharge into the sloughs from Cullinan Ranch during those events will be brief and quickly diluted. Breaching would occur prior to January 30 when salmonids are expected to migrate through the area.

8. Page 49, the text has been revised to read:

Component 8 – Long-Term Monitoring

Documentation of the physical and biological changes that occur both prior to and following restoration of the Cullinan Ranch Site, including the possible deposition of mercury within Cullinan, will be an essential component of the proposed restoration project. Monitoring activities will be conducted to document changes in tidal hydraulics, geomorphology, habitat types, and functions as restoration progresses. Salt marsh harvest mouse, California clapper rail and other estuarine-dependent species will be monitored. Monitoring activities will also facilitate an adaptive management strategy to ensure that implementation of the restoration project results in stable, fully functioning and self sustaining tidal marsh habitat. Monitoring will likely be conducted in both dry (May – October) and wet (November – April) seasons. Since slough channels are expected to be primary habitats for fish and wildlife species, the Cullinan Ranch Site will be stratified into marsh plain and slough channel habitat types as it develops. Biological monitoring samples from the Cullinan Ranch Site will be gathered within a spatial framework with samples being taken at varying intensities within established grid systems or along transects. All sample locations will be geo-referenced to the nearest meter in a horizontal plane with a global positioning system (GPS) and all data will be digitized into a geographical information system (GIS) database. Aerial photographs will be taken in 3, 5 or 10 year time periods to document large-scale habitat changes depending on conditions at the site. A detailed monitoring plan will be developed using the most recent information available from surrounding restoration sites.

Monitoring activities will also facilitate an adaptive management strategy to ensure that implementation of the restoration project results in stable, fully functioning and self sustaining

tidal marsh habitat. The Cullinan project will use the Napa Plant Site Restoration Project monitoring plan (Appendix 4 of the Final EIS/EIR) as a basis for its monitoring plan. The Napa Plant Site Restoration Project monitoring plan will be modified to match the conditions, timeline and needs of the Cullinan project. Monitoring objectives, timelines, information needs and the processes for evaluation, management and communication of results are not expected to differ substantially from those described in the Napa Plant Site Restoration Project monitoring plan.

9. Page 53, the Partial Restoration Alternative the text is revised to read:

Under the Partial Restoration Alternative, restoration would occur within a 300-acre area on the east side of the Site through the process of natural sedimentation with some on-site and off-site material used for internal levee work. *Levee lowering, construction of the buttress levee, and contouring of borrow soils to broaden areas closest to Guadalcanal Village would be used to produce a minimum of 30 acres at marsh plain elevations adjacent to a source population at Guadalcanal Village. Clean dredged sediments as well as clean fill soils from other construction activities will be actively sought to supplement onsite construction activities to achieve the minimum 300-acre goal. An additional 50 acres of tidal marsh may be created if sufficient clean soils are available and budget allows.* Under this alternative, one 100-foot wide breach would occur between Cullinan Ranch and Dutchman Slough and one between Cullinan Ranch and Guadalcanal Village (Figure 2-8). A 3,500-foot long internal levee would be constructed at an elevation of 9.0 feet (NGVD 1929) on top of the existing access road from Dutchman Slough to the Highway 37 embankment, and existing culverts located under this levee would be removed. This levee would bisect the site and maintain the western 1,200 acres as existing seasonal wetlands. Under this alternative, the PG&E tower access boardwalk would not be constructed, the new public access area and parking lot would also not be built; the Pond 1 levee improvements would not take place, and over four miles of the existing Dutchman Slough levee would be maintained in perpetuity along the western portion of the Site.

The anticipated immediate habitat type (5 to 10 years) that will result from the Partial Restoration Alternative will be a minimum 30 acres of tidal marsh habitat adjacent to Guadalcanal Village including non-contiguous tidal marsh habitat along Dutchman Slough where levee lowering activities will occur. This acreage will be adjacent to intertidal mudflats and open water that will persist for a period of 10 to 50 years into the future as sediments are naturally deposited into the site, channels form, and marsh plain elevation is reached. Some areas that are more deeply excavated for channels and deep pools are intended to be self-sustaining by the daily tidal prism and remain open. If these channels or pools sediment in, no dredging will be conducted. Anticipated wildlife use within the first 10 years would include salt marsh harvest mouse, clapper rail, black rail, and other tidal marsh dependent species. Deep water areas will accommodate diving and some puddle ducks. Areas between the tidal marsh zone and deeper water will accommodate shore and water birds during low tide events

Surveys to determine presence or absence of special status plant species will be conducted prior to construction activities and special status plant species, if located, will be salvaged and propagated at the refuge native plant nursery. These plants will be re-introduced to the site or other sites on the Refuge at a later time.

~~Furthermore~~ The Partial Restoration Alternative Area will border an approximately 5,700-foot section of the Highway 37 embankment. In order to minimize potential flooding of Highway 37,

a buttress levee would be constructed against the existing embankment along a 3,500-foot section of the southeast corner of the Cullinan Ranch Site where the existing embankment could be inundated by tidal action. Armoring along the ~~3,500-foot buttress levee and~~ 2,200 feet of highway embankment would also be provided within this section to protect the ~~existing~~ levee from erosion. The buttress levee, which would be constructed to a height of 9.0 feet (NGVD 1929), would protect low sections of the highway from tidal waters; it would also prevent storm water runoff from escaping the road shoulder. A grassy swale would be constructed between the existing highway embankment and the buttress levee to convey stormwater runoff from the highway. The water would drain eastward into a detention basin consisting of an abandoned ditch segment between Guadalcanal Village and Highway 37, where it would be held until it could drain into the Cullinan Ranch Site at low tide through tide gates. Alternatively, the stormwater could potentially be diverted into the existing drainage canals located near Guadalcanal Village and the Mare Island Bridge. *The buttress levee and riprap armoring are located within Caltrans' Right-of-Way. As a matter of public safety the design for these components will be closely coordinated with Caltrans. Construction-related vehicular routing would also be coordinated with Caltrans and other agencies as necessary. Design details, plans and other technical information will be submitted to Caltrans at appropriate design levels for their review and comment. A SWPPP will be developed and include BMPs to control construction related runoff and prevent any discharges to surrounding water during restoration construction activities. Both the Solano and Napa Mosquito Abatement Districts (MADs) would be consulted during design, construction, and operation phases regarding mosquito abatement control measures for the Cullinan Ranch Site.*

10. Page 59, the Preferred Restoration Alternative the text has been revised to read:

Protect Highway 37 from Flooding and Erosion

A buttress levee would be constructed adjacent to approximately 3,500 feet of highway embankment. The buttress levee, being higher than the adjacent highway embankment, would be designed with a grassy swale just below the highway shoulder to convey rainwater away from the embankment. The water would drain eastward into a detention basin consisting of an abandoned ditch segment between Guadalcanal Village and Highway 37, where it would be held until it could drain into the Cullinan Ranch Site at low tide through tide gates. The buttress levee would be constructed with a flat slope into the Cullinan Ranch Site, which would provide transitional habitat as well as erosion resistance. Seeding of the swale or planting plugs using native plants on the buttress levee may also be implemented to further enhance the embankment's habitat contribution and ability to resist erosion. *The specific design of the drainage water flow along the grassy swale to Guadalcanal Village including drainage patterns, tidal conditions, storage capacity of the drainage basin, and alternative flood flow provisions, will be detailed in the final design plans. Temporary protection measures implemented during construction will be detailed in the SWPPP.* Construction of the buttress levee would require the use of approximately 114,000 cubic yards of fill material (this quantity includes filling the entire length of the toe drain). Assuming that the buttress levee is completely constructed using imported material, and that the material will swell 30%, it would take approximately 8,200 truck trips, using a standard 18 cubic yard transfer truck.

The remaining approximately 12,100 feet of highway embankment that is currently not protected by a buttress levee would be armored to prevent erosion. The adjacent toe drain would be filled to match the adjacent field elevation as part of the buttress levee construction and is intended to

provide a firm base for the armoring. It would take approximately 35,800 cubic yards of riprap to armor the slope. Assuming the use of transfer trucks, again with an 18 cubic yard capacity, and with proper coordination the rock importation would require 2,646 truck trips and take approximately one month to complete. Once the material reaches the Cullinan Ranch Site, the rock would be placed on the existing embankment slope on top of non-woven fabric in accordance to Caltrans standard specifications. *A layer of fill will be placed on any riprap between MHHW (approximately 3.7 feet NGVD 1929) and the top of the riprap (7 feet NGVD 1929), and salt-tolerant native grasses planted in the fill, where appropriate. The intent of the grass cover is to minimize infestation by non-native or invasive plant species. This will require the excavation of an additional approximately 5,000 cy of material from inside the site, but would not result in any additional truck trips outside the site. This volume is a 1.4% increase in onsite excavation. It would result in an additional excavation and fill of 3.1 acres and a change in the area of disturbance of 1.6%.* This operation will take place before the buttress levee is constructed.

11. Page 60, the Partial Restoration Alternative the text has been revised to read:

Protect Highway 37 from Flooding and Erosion

Protecting Highway 37 would involve construction of a buttress levee adjacent to the highway. The buttress levee would be constructed adjacent to an approximately 3,500-foot section of highway embankment. The buttress levee, being higher than the adjacent highway embankment, would be designed with a grassy swale just below the highway shoulder to convey rainwater away from the embankment. The water would drain eastward into a detention basin consisting of an abandoned ditch segment between Guadalcanal Village and Highway 37, where it would be held until it could drain into the Cullinan Ranch Site at low tide through tide gates. *The specific design of the drainage water flow along the grassy swale to Guadalcanal Village including drainage patterns, tidal conditions, storage capacity of the drainage basin, and alternative flood flow provisions, will be detailed in the final design plans. Temporary protection measures implemented during construction will be detailed in the SWPPP.* The embankment would be constructed with a flat slope, which would provide transitional habitat as well as erosion resistance. Seeding of the swale or planting plugs on the embankment may also be implemented to further enhance the embankment's habitat contribution and ability to resist erosion. Construction of the buttress levee would require the use of approximately ~~101,700~~ 102,000 cubic yards of imported fill material. Assuming the use of transfer trucks with an 18 cubic yard capacity, it would take approximately 5,167 truckloads to construct the buttress entirely with imported material, or approximately 7,341 truck trips *(assuming 20% swell of soil volume)*. With a productivity of 96 truckloads a day it would take an estimated four months to complete the import operation.

The remaining approximately 2,200-foot section of highway embankment that is currently not protected by a buttress levee would be armored to prevent erosion. If riprap material is used to armor the area, it is estimated that 5,100 cubic yards of riprap would have to be imported for this task, resulting in approximately 377 truck trips to import the material. With proper coordination of the rock importation, this task would likely be accomplished within one week. *In addition between MHHW (~3.7 feet) and 7 feet NGVD 1929, a layer of soil will be placed over the riprap and native salt tolerant grasses will be planted. The intent of the grass cover is to minimize infestation by non-native or invasive plant species. This will require the excavation of an additional approximately 5,000 cy of material from inside the site, but would not result in any*

additional truck trips outside the site. This volume is a 1.4% increase in onsite excavation. It would result in an additional excavation and fill of 3.1 acres and a change in the area of disturbance of 1.6%. Similar to the Preferred *Restoration* Alternative, the toe drain adjacent to the highway would be filled to field elevation as part of the buttress levee construction in order to provide a sound base for the armoring. Once the armoring material reaches the Cullinan Ranch Site, the rock would be placed on the existing embankment slope on top of non-woven fabric in accordance to Caltrans standard specifications.

12. Page 62, a portion of Table 2-1 has been modified as shown below in the partial excerpt of Table 2-1.

Table 2-1. Summary Comparison of Proposed Alternatives

	No-Action Alternative	Preferred Restoration Alternative	Partial Restoration Alternative
Breach the levee along Dutchman and South Sloughs	Not proposed.	Two west Up to four breaches in Cullinan Ranch along Dutchman and South Sloughs.	One breach from Cullinan Ranch to Dutchman Slough near Guadalcanal Village.

Clarifications and Changes to Chapter 3

1. Page 75, the text has been revised to read:

HYD-3. Implementation of the No-Action Alternative would not result in hydrologic changes that could adversely affect existing or planned biological communities

Under the No-Action Alternative, the Cullinan Ranch Site would not be open to tidal inundation and all existing levees and existing fringe marsh habitat on the interior of these levees would remain unchanged, except during periods of levee repair and maintenance. Furthermore, the existing upland and transitional marsh habitats would remain unchanged. Therefore, there would not be any significant adverse effects on existing biological communities.

However, implementation of the No-Action Alternative would hinder the development of a continuous tidal marsh corridor that would be connected following restoration of the Cullinan Ranch Site, along with additional planned neighboring sites, to tidal exchange. Although there would still be large areas of existing and restored tidal marsh habitats surrounding the project Site, the overall connectivity and efficiency of the system would be reduced through preserving the Site in existing conditions. ~~Less-than-significant impact~~ **No impact.**

HYD-4. Implementation of the No-Action Alternative would not result in Exceedances of Water Quality Objectives

Under the No-Action Alternative the Cullinan Ranch Site would not be opened up to tidal exchange. Existing surface water quality conditions would remain, which are influenced by

precipitation and runoff from adjacent areas. The existing water quality conditions at the Cullinan Ranch Site have not resulted in exceedances of established water quality objectives, and would remain largely unchanged. Therefore, there would not be any significant adverse effects related to water quality impacts under this alternative. ~~Less-than-significant impact~~ **No impact**

2. Page 75, the text has been revised to read:

HYD-5. Implementation of the Preferred Restoration Alternative would result in changes in the tidal prism leading to increased peak volumes

Under the Preferred Restoration Alternative, breaches to Dutchman and South Sloughs would increase the tidal prism throughout the area dramatically as Cullinan Ranch, which had been completely diked and separated from tidal influence, would become inundated with tidal flows from the adjacent slough channels. Breaches in Dutchman Slough would also be coordinated with those in the southern perimeter levee of Pond 3, providing a complimentary hydrologic system between the two restored sites. This would improve water circulation within the restored Cullinan Ranch Site, and add to the overall increased tidal prism within the system.

Hydrologic modeling investigations performed by Moffat & Nichol concluded that following implementation of the Preferred Restoration Alternative, high water levels within Dutchman Slough would be similar to existing conditions on the Cullinan Ranch Site while low water elevations would be increased due to the large quantities of water ebbing from the Site. Additionally, peak velocities are expected to increase to approximately four times the existing flow conditions at the mouth of Dutchman Slough, and five to six times the velocities currently found at the mouth of South Slough. These changes in flow greatly exceed the existing capacities of the channels, and would result in scour throughout both systems. While the mouth of Dutchman Slough is expected to widen and deepen, the western reach of the slough could actually decrease in size when water is diverted to the Site. Tidal flows within the western reaches of Dutchman Slough would be composed of waters remaining after the Cullinan Ranch Site has filled. The slow speed of the flows would result in deposition of sediments within the western portion of Dutchman Slough. As a result, the slough would more closely resemble the historical conditions in which the western portions of Dutchman Slough were relatively silted in. The Preferred Restoration Alternative would also result in an increased tidal prism in the South Slough system, overall widening and deepening the channel and returning it to its near historic conditions, when it acted as the primary source of flow through the area. The Tables 3.1.3 and 3.1.4 summarize the hydrologic modeling results for the Preferred Restoration Alternative. ~~There are no available data on vertical land motion in the Cullinan area.~~ Additional supporting documentation is included in Appendix A (Moffat & Nichol 2004).

Immediately following levee breaching for the Preferred Restoration Alternative, there would be a dramatic increase in the tidal prism throughout the area as tidal action is allowed to return to an area that is currently diked and void of tidal influence. The prism would gradually decrease again as the Site becomes inundated and tidal marsh elevations increase. During the approximately 60 years required for the channel systems and marsh plain elevations to establish on the Site the tidal prism is expected to increase slowly once again, and Dutchman and South Sloughs would gradually reach equilibrium widths and depths to support the evolving ecosystem on the restored Cullinan Ranch Site.

Although there would be dramatic changes in the slough channels and tidal prism within the vicinity of the project area immediately following implementation, potential flooding or hazards to infrastructure and/or public safety would be minimized through project features described in 2.0 Purpose and Need and Proposed Alternatives. *These-The Highway 37 embankment ranges in elevation from 4 to 11 feet (NGVD 1929) along Cullinan Ranch (p. 45). The average existing elevation within Cullinan Ranch is 2.0 feet NGVD, 3-8 feet below sea level (p. 86). The project will include the proposed reinforcement of levees that separate the project area from adjacent properties and roadways, and the installation of water control structures. The Pond 1 levee will be raised to a minimum elevation of 8 feet NGVD 1929. The 0.7-mile-long buttress levee along Highway 37 would be raised to an elevation of 9 feet NGVD 1929. The armored section of Highway 37 meets or exceeds 8 feet NGVD 1929 in elevation. These levee heights are equal or greater than those on surrounding properties.* In addition, the increasing flow velocities and tidal prism would not prevent adjacent waterways from being navigable, although South Slough would replace Dutchman Slough as the primary throughway in the area. Immediately following breaching there would be dramatic changes to the system, but as the Site becomes inundated and the prism once again declines, the overall navigability of the system is not expected to significantly change. Therefore, no significant impacts are expected that would increase the risk of flooding or damage to existing infrastructure or property as a result of increased flow velocities and tidal prism from project implementation. *Less-than-significant impact.*

3. Page 78, the text has been revised to read:

HYD-6. Implementation of the Preferred Restoration Alternative would Result in Hydrologic Changes that could Adversely Affect Existing or Planned Biological Communities

Implementation of the Preferred Restoration Alternative would result in the removal of existing fringe habitats, including marshes and uplands that have established along the levees that support waterways adjacent to the Cullinan Ranch Site. In particular, habitats along Dutchman and South Sloughs, and Napa River may be impacted. The removal of these habitats could occur as the tidal prism within this area increases, scouring the channels and altering sediment dispersal throughout the system. In addition, seasonal wetland and upland habitats that have established on the Cullinan Ranch Site would be permanently inundated through implementation of the Preferred Restoration Alternative. Impacts related to the loss of existing habitat are evaluated in detail in 3.2 Biological Resources.

Implementation of the Preferred Restoration Alternative would also allow the necessary conditions on the Cullinan Ranch Site to establish in order to support planned biological communities. Based on the hydrologic modeling conducted for the Proposed Action, over the long run, the trajectory of habitat development in the marsh would be largely controlled by sediment deposition, *sea level rise*, and the salinity of the system, as influenced by the evolving tidal prism.

No specific sedimentation rate data is available for the project area. Pond 3 was recently restored to tidal action as part of the Napa Sonoma Restoration Project and would be the nearest source of sediment data. However, those data have not yet been analyzed (personal communication, Karen Taylor, CDFG Biologist). Once available, the Pond 3 sedimentation data would provide a reasonable estimate of sedimentation rates for the Cullinan Ranch project

area. In addition, the U.S. Geological Survey is currently conducting a bathymetry study in the region, but they are not expected to have data until mid-2009. These data, when available, will be used to refine the project design.

Accurate sedimentation rates and vertical land motion rates are unknown for the Cullinan Ranch site and therefore an accurate estimate of the rate of relative sea level rise for the project area cannot be calculated. Moffatt & Nichol utilized 2.0 mm/year sea level rise in hydrologic modeling and analysis, in accordance with 2001 IPCC predictions to model the rate of habitat development.

The sloughs supplying water for the site (South and Dutchman Sloughs) are not sufficiently sized to provide the full tidal prism to Cullinan. After the breaching, the site will be muted tidal.

Following the initial breaching of the levees, the lower portions of Dutchman and South Sloughs would deepen and widen in response to the increased volumes and velocity of water moving through the waterways as tidal inundation occurs on the Site. *This is estimated to take 2-20 years.* At this time, the Site would remain largely inundated, and the tidal prism would again decrease. As sedimentation occurs at the Site, the tidal prism would once again slowly increase as a channel system evolves across the Site, and water exchange increases between the Site and adjacent slough channels. Over an approximately 60-year period, equilibrium conditions would be reached, and the planned tidal marsh habitat would form at approximately one foot above the mean tide level (Moffatt & Nichol 2004). Although this duration could be influenced by changes in the sediment supply, the salinity regime, and the rate of sea level rise, as well as changes in other sites as further restoration projects may be implemented in the area, the overall outcome of the project is expected to be the same. Therefore, hydrologic changes resulting from implementation of this alternative would not be expected to adversely affect planned biological communities, as these communities could be established on the Site once marsh plain elevations are reached. ***Less-than-significant impact.***

4. Page 78, the text has been revised to read:

HYD-7. Implementation of the Preferred Restoration Alternative would result in Hydrologic changes that cause Erosion of Adjacent Levees

Under implementation of the Preferred Restoration Alternative, scour would widen the channels of both Dutchman and South Sloughs, causing the channels to erode existing perimeter levees. Additionally, part of Pritchett Marsh and levees along the Guadalcanal Village wetlands and Pond 3 may also erode as a result of the changing flow patterns within the sloughs. Currently, the existing levee systems experience some on-going active erosion due to tidal fluctuation within the slough system. However, these conditions would be greatly magnified with the additional flow that is expected within the slough channels through implementing the Preferred Restoration Alternative. *Initial modeling results from Moffatt and Nichol indicated that breaches along the Cullinan Ranch portion of the South and Dutchman Slough levee could result in the deepening of Dutchman slough and in scouring of Pritchett Marsh to the southeast of Guadalcanal Village at the mouth of Dutchman Slough. The modeling results indicate that if opposing Pond 3 levee breaches are completed at the same time, this will draw Napa River flow through Pond 3 This would ameliorate the potential for scour at the mouth of Dutchman Slough, particularly at Pritchett Marsh.* The erosion of these areas may result in the loss of fringe tidal marsh habitat that has formed along the perimeter levees. However, as sediment accumulates on

the Cullinan Ranch Site, the tidal prism within the system will stabilize, and erosion rates will decrease along these levees, allowing the formation of new tidal marsh fringe habitat.

In addition to erosion, wind-induced waves pose a significant risk in terms of erosion on perimeter levees. The size of wind-generated waves is primarily a function of the wind speed, wind fetch, wind duration, and water depth (Jones & Stokes 2003). Because the Site is approximately –2.0 feet NGVD, breaching the levee would result in complete inundation of the Site, which would produce conditions favorable to large wave development, as the Site is generally flat in nature, and does not support natural features or structures to dissipate wave energy. Therefore, inadequate protection of the Highway 37 levee from wind-induced waves from within the Cullinan Ranch Site could result in significant erosion of the levees. Previous hydrologic studies completed by Moffat & Nichol determined that a levee height of 8.0 feet NGVD for the Highway 37 levee, and 7.0 feet NGVD for the Pond 1 levee would be sufficient to protect the eastern portion of the highway from extreme tidal events (Moffat & Nichol 2002). In addition, Caltrans requested that the height for the Highway 37 levee be raised to 9.0 feet NGVD due to overtopping issues they encountered on the Guadalcanal Restoration Site. In order to protect these areas, these existing levees would be raised and re-enforced, as described in the 2.0 *Purpose and Need and Proposed Alternatives*, in order to minimize potential erosion effects. The armoring may consist of, but is not limited to, placement of stone, flattening of levee slopes, and planting vegetation. Consequently, significant adverse effects are not expected to result from excessive or unexpected erosion of adjacent levees under implementation of the Preferred Restoration Alternative. ***Less-than-significant impact.***

5. Page 79, the following text has been added to HYD 9:

HYD-9. Implementation of the Preferred Restoration Alternative would not Discharge Contaminants into the Waters of the U.S. Bay Delta Estuary

Implementation of the Preferred Restoration Alternative could initially, through pre-flooding, create a water body with inadequate tidal flushing ~~resulting in stagnation and depressed dissolved oxygen concentrations, until the Dutchman and South Slough levees are breached.~~ *Pond 1 is perched well above Cullinan Ranch and water will only come into the site. During the period of flooding before the levees are breached, dissolved oxygen concentrations could fall below ideal levels, but pre-flooding will only be used to displace mammals from the site and pre-flooding will be followed immediately (within 1-2 weeks) by breaching activities.* Breaching is scheduled to occur during the winter when rains and high water conditions in the Napa River and surrounding sloughs ~~exists, therefore,~~ providing immediate ~~dilution of anaerobic waters tidal exchange.~~ Breaching would occur before January 30 when salmonids are expected to migrate through the area. After breaching, as the Site continues to accumulate sediment and the tidal prism increase, water quality conditions will improve as the exchange of water to and from the Site improves. ~~However, it could take several years for these conditions to occur.~~ Following the establishment of the mature channel system on the Site, water moving on and off the Site would be relatively the same as that in the adjacent channels, and therefore ~~will not is not expected to~~ exceed water quality objectives.

In addition, BMPs will be implemented and include, but are not limited to, a designated nightly staging area, confined refueling area, and the placement of drip cloths under equipment, among other appropriate management practices. Cullinan Ranch is a self-contained site and no

discharges to receiving waters including storm water will occur until the site is breached, at which time, all slope stabilization and re-vegetation measures will be in place, with the possible exception of the levee lowering. Levee lowering would be done such that all material removed would be brought to the interior slope and all perimeter vegetation would be left intact and undisturbed. Therefore, there would not be adverse effects resulting in the discharging of contaminants that would exceed water quality objectives with implementation of the Preferred Restoration Alternative. ***Less-than-significant impact.***

6. Page 80, the text has been revised to read:

HYD-11. Implementation of the Partial Restoration Alternative would Result in Changes in the Tidal Prism Leading to Increased Peak Volumes

Under the Partial Restoration Alternative, a single breach to Dutchman Slough would increase the overall tidal prism throughout the adjacent slough channel system as a 300-acre area of Cullinan Ranch, now completely diked and separated from tidal influence, would become inundated with tidal flows. Hydrologic modeling results indicate that as a result of this action there would not be significant changes in water levels within the adjacent slough channels. However, modeling results indicated that implementing restoration on only the eastern portion of the Site would result in peak velocities nearly doubling in the immediate vicinity of the mouth of Dutchman Slough. Additionally, velocities in the slough downstream from the breach site would likely be reduced, as much of the flow from Dutchman Slough would enter the Cullinan Ranch Site. Tables 3.1-5 and 3.1-6 summarize the modeling results for the Partial Restoration Alternative. Please refer to Appendix A for additional information on the model used and the results generated from the model (Moffat and Nichol 2004). *There is no available data on vertical land motion in the Cullinan area.*

Unlike the Preferred Restoration Alternative, implementation of this alternative would not result in significant changes to the hydrology of South Slough. However, similar to the Preferred Restoration Alternative, the mouth and adjacent reaches of Dutchman Slough would scour over time due to the increased flow and velocities that would occur following the breach into Cullinan Ranch. Over time, as the mouth of the slough scours, increasing the depth and width of the channel, a greater tidal prism could be supported by the system, and would increase tidal exchange from the slough to the Cullinan Ranch Site. As the Site continues to evolve and accumulate sediment, the tidal prism within the area would slowly increase until equilibrium conditions are reached.

As a result of implementing the Partial Restoration Alternative, increases in the tidal prism and peak velocities would initially flood the Cullinan Ranch Site and erode portions of the perimeter levees that contain Dutchman Slough. However, through the reinforcement of levees, as described in 2.0 Purpose and Need and Proposed Alternatives, damage to existing levees, infrastructure, and property, or risk to public safety would not be expected. *The Pond 1 levee will be raised to a minimum elevation of 8 feet NGVD 1929. The 0.7-mile-long buttress levee along Highway 37 would be raised to an elevation of 9 feet NGVD 1929. The armored section of Highway 37 meets or exceeds 8 feet NGVD 1929 in elevation. These levee heights are equal or greater than those on surrounding properties.* In addition, changes in the navigability of the adjacent slough channels would not be greatly affected, as Dutchman Slough, through this

alternative, would remain largely open and connected to the larger slough channel network in the area. *Less-than-significant impact.*

7. Page 82, the text has been revised to read:

HYD-12. Implementation of the Partial Restoration Alternative would Result in Hydrologic Changes that could Adversely Affect Existing or Planned Biological Communities

Implementation of the Partial Restoration Alternative would result in the removal of existing fringe habitats, including marshes and uplands that have established along the levees that support waterways adjacent to the Cullinan Ranch Site. This would occur as the channels scour and sedimentation rate changes, particularly in Dutchman Slough, causing the mouth of the channel to increase in size beyond the existing levees. In addition, wetland and upland habitats that have established on the 300-acre Partial Restoration Site in the eastern portion of the Cullinan Ranch Site would be inundated through implementation of the *Preferred-Partial* Restoration Alternative. Impacts related to existing habitat loss are evaluated in detail in 3.2 *Biological Resources*.

Implementation of the Partial Restoration Alternative would also produce the necessary conditions on the Cullinan Ranch Site to support planned biological communities. Based on the hydrologic modeling conducted for the Partial Restoration Alternative, the trajectory of habitat development in the marsh would be largely controlled by sediment deposition, *sea level rise*, and the salinity of the system, as influenced by the evolving tidal prism.

No specific sedimentation rate data is available for the project area. Pond 3 was recently restored to tidal action as part of the Napa Sonoma Restoration Project and would be the nearest source of sediment data. However, those data have not yet been collected and analyzed (personal communication, Karen Taylor, CDFG Biologist). Once available, the Pond 3 sedimentation data would provide a reasonable estimate of sedimentation rates for the Cullinan Ranch project area. In addition, the U.S. Geological Survey is currently conducting a bathymetry study in the region, but they are not expected to have data until mid-2009. These data when available will be used to refine the project design.

Accurate sedimentation rates and vertical land motion rates are unknown for the Cullinan Ranch site and therefore an accurate estimate of the rate of relative sea level rise for the project area cannot be calculated. Moffatt & Nichol utilized 2.0 mm/year sea level rise in hydrologic modeling and analysis, in accordance with 2001 IPCC predictions to model the rate of habitat development.

Following the initial breaching of the Dutchman Slough levee, the mouth of the slough channel would deepen and widen in response to the increased tidal prism and velocity of water moving through the channel as tidal inundation occurs on-site. At this time, the Site would remain largely inundated. As the supporting sloughs scour the prism would slowly increase and sediment accumulate on the Site, supporting channel evolution and increasing water exchange on and off the Site, until equilibrium conditions are reached. At this point, new marsh habitat can begin to establish along the channel margins, at approximately one foot above mean tide level. The time required to reach this point is estimated to take approximately 100 years, which would be 40

years longer than the Preferred Restoration Alternative, due to the decrease in tidal exchange from the Site to the adjacent slough channels. Additionally, the Site would not be restored in conjunction with Pond 3. This timing could be influenced by changes in the sediment supply, the salinity regime, and the rate of sea level rise, as well as changes in other sites as further restoration projects may be implemented in the area. Consequently, hydrologic changes resulting from implementation of this alternative would not be expected to adversely affect planned biological communities, as these communities could be established on the Site once marsh plain elevations are reached. *Less-than-significant impact.*

8. Page 82, the text has been revised to read:

HYD-13. Implementation of the Partial Restoration Alternative would result in Hydrologic changes that cause Erosion of Adjacent Levees

Under implementation of the Partial Restoration Alternative, the anticipated scouring at the mouth of Dutchman Slough and deepening and widening the channel may cause the erosion of levees along the restored reaches. Additionally, areas of Pritchett Marsh and levees along the Guadalcanal Village wetlands could also be eroded with the increased tidal prism and flow velocities through this area. *Initial modeling results from Moffatt and Nichol indicated that breaches along the Cullinan Ranch portion of the Dutchman Slough levee could result deepening of Dutchman slough and in scouring of Pritchett Marsh to the southeast of Guadalcanal Village at the mouth of Dutchman Slough.* Although the effects would be smaller than those under the Preferred Restoration Alternative, erosion potential under this alternative is still significant. Due to the active nature of the existing tidal prism, existing levees and adjacent habitats currently experience some level of active erosion at all times. However, following implementation of the Partial Restoration Alternative, erosion rates would greatly increase.

Levees adjacent to the Cullinan Ranch Site may also be subject to increased erosion from tidal current and wave forces under the Partial Restoration Alternative. As described in *2.0 Purpose and Need and Proposed Alternatives*, the portion of the Cullinan Ranch levee that is located adjacent to Dutchman Slough would be repaired and protected from tidal influence and erosion that already exists under this alternative. In order to minimize these potential effects, erosion protection, or armoring, would be constructed in place along the 5,700-foot section of the levee that lies adjacent to the restored reach. In order to minimize potential flooding of Highway 37 a buttress levee would be constructed against the existing embankment along a 3,500-foot section of the southeast corner of the Cullinan Ranch Site where the existing embankment could be inundated by tidal action. *Armoring along the 3,500-foot buttress levee would protect the levee from erosion. The buttress levee would be constructed with a top elevation of 9.0 feet and have a 5:1 horizontal to vertical slope from 9.0 feet to 8.0 feet, after which it would transition to a 10:1 slope. The gentle slope would protect the buttress levee from erosion. The remaining 2,200 feet along Highway 37 would be armored with riprap to minimize erosion.* The armoring may consist of, but is not limited to, placement of riprap, flattening of levee slopes, and planting vegetation (e.g. pickleweed and native salt tolerant grasses). *The internal 3,500-foot levee constructed under the partial restoration alternative along the existing eastern access road from Highway 37 to the Dutchman Slough levee would have a 7:1 side slope on the tidal side and a 5:1 side slope on the seasonal side. The gentle levee slopes would minimize erosion.* Consequently, adverse effects resulting in excessive or unexpected erosion of adjacent levees

under implementation of the Partial Restoration Alternative are not expected. *Less-than-significant impact.*

9. Page 107, the text has been revised to read:

BIO-1. Implementation of the No-Action Alternative could result in Potentially Adverse Effects on Biological Resources

Under the No-Action Alternative, restoration of the Cullinan Ranch Site would not be undertaken by the lead agencies, and the Site would remain in its current state, which is devoid of tidal influence. In its current condition, there is a high likelihood that non-native, invasive plant populations, including populations of pampas grass and perennial pepperweed, would continue to expand, outcompeting native species and decreasing habitat value for special status species at the Site. It is possible that the cattail vegetation that occurs at the Cullinan Ranch Site would continue to dominate and choke the seasonal wetland habitat, thereby eliminating valuable open water habitat. Open water provides habitat for over-wintering, migrating and roosting waterfowl. Foraging and roosting opportunities for migrating or wintering waterfowl would be substantially reduced over time by encroachment of the existing vegetation unless the Site was managed to maintain open water areas.

Under this alternative, the USFWS would be required to maintain the Dutchman Slough levee in perpetuity to prevent flooding of Highway 37. As the levees age and further erode, levee maintenance activities, such as armoring to prevent levee failure, would need to be implemented. Such activities could cause periodic, short-term disturbances to existing habitats at the Site as well as remove segments of remnant tidal marsh. However, the disturbances would not differ from those that currently occur during existing levee maintenance activities. ~~*Less-than-significant impact.*~~ *No impact.*

10. Page 108, the text has been revised to read:

BIO-3. Implementation of the Preferred Restoration Alternative ~~would~~ result in the Temporary Loss of Salt Marsh Harvest Mouse Habitat and Potential Mortality of Individual Salt Marsh Harvest Mice

11. Page 109, the text has been revised to read:

Mitigation Measure BIO-3.1: Remove Salt Marsh Harvest Mouse Habitat, Place Barrier Fencing in Buttress Levee Construction Area, and Create Approximately 30 Acres of Salt Marsh Harvest Mouse Habitat. USFWS will, as part of their annual salt marsh harvest mouse (SMHM) monitoring, trap the tidal marsh areas within the project area where the levee will be constructed to determine presence or absence of SMHM. The areas containing pickleweed will be fenced prior to monitoring and if mice are found they will be moved to adjacent available habitat out of the project area. A bobcat front loader and weed eaters will be used to remove pickleweed vegetation (sod) from the Site and re-plant pickleweed sod onto newly constructed and lowered levee sections. Transplanting pickleweed sod was successfully implemented on the Tubbs Setback restoration project where the sod sites contributed the greatest number of native salt marsh-associated species, plant biomass, and cover of litter and wrack relative to other plot type sites (Downard, et.al. 2003). The barrier fencing around the construction areas will be left in

place prior to implementation of the Proposed Action. Installation of fencing will prevent re-entry into the construction area from adjacent tidal marsh habitat. *In addition the Project will replace 15 acres of low grade SMHM habitat with more than 30 acres of SMHM habitat adjacent to Guadalcanal Village by lowering the existing levees to marsh plain elevation prior to breaching. If additional import material is available and budget allows, an additional 50 acres of tidal SMHM marsh habitat would be created in addition to the 30 acres addressed above.* Prior to construction, the UFWS and CDFG will consult to evaluate these and any other appropriate mitigation methods for avoiding mortality of salt marsh harvest mice.

Mitigation Measure BIO-3.2: Slow Flood-up of Cullinan Ranch. Prior to breaching the South and Dutchman Slough levees, the Cullinan Ranch Site will be slowly flooded to *capacity a shallow depth*, in stages, using water from the CDFG Pond 1 via the water control structures. This slow, staged procedure will allow the movement of the majority of mammals out of the area into adjacent tidal marsh and areas within Guadalcanal without being forced, en masse, onto Highway 37.

12. Page 109, the text has been revised to read:

BIO-4. Implementation of the Preferred Restoration Alternative *would result in Temporary Habitat Loss and* could Disturb California Clapper Rails and Black Rails

13. Page 110, the text has been revised and a new mitigation measure has been added:

BIO-5. Implementation of the Preferred Restoration Alternative could Disturb San Pablo Song Sparrow and Result in Abandoned Nests and Mortality of Young

If the San Pablo song sparrow is present within or adjacent to areas near the proposed breach locations, individual members of the species could be directly harmed when the levee breaches are implemented. Furthermore, nesting habitat could be destroyed, or nesting young could be killed by construction equipment during proposed restoration activities at the Site. The loss or removal of suitable habitat or direct mortality of individuals of this species would constitute an adverse effect. To minimize this effect, the following mitigation measure shall be implemented. *Less-than-significant impact, with implementation of mitigation.*

Mitigation Measure BIO-5.1: *Preclude Nesting by San Pablo Song Sparrow by Removing Preferred Nesting Vegetation in Salt Marsh Habitat in the Vicinity of the Breaches.* *San Pablo song sparrows live in salt marsh habitat (Shuford et al., 2008) therefore they are expected to be restricted to the areas of Cullinan Ranch where salt marsh occurs, primarily outboard of the levees along Dutchman and South Sloughs. In the year prior to breach construction, qualified biologists will remove preferred nesting habitat (i.e. gumplant and coyote bush) from the vicinity of the proposed breaches. Removal of these plants will occur 50 feet beyond the extent of the proposed breaches in each direction.*

~~Mitigation Measure BIO-5.15.2: Locate and Avoid San Pablo Song Sparrow Habitats and Nests at the Cullinan Ranch Site. Conduct Surveys Prior to Breaching. If San Pablo Song Sparrows are Present, Construct Breaches Outside of Breeding Season.~~ Pre-construction surveys ~~to identify the locations of San Pablo song~~

~~sparrow habitat in the vicinity of the proposed breaches~~ shall be conducted by a qualified biologist in coordination with the USFWS and CDFG. ~~If San Pablo song sparrow nests are identified on the Cullinan Ranch Site, the nest locations shall be mapped and nesting territories shall be estimated.~~ Pre-construction survey results shall be submitted to USFWS and CDFG prior to initiation of construction activities. If active breeding is not observed within 250 feet of proposed construction activities, construction may proceed. If active breeding territories are recorded, USFWS and the CDFG shall determine if further mitigation measures to avoid or reduce potential mortality of this species are required.

14. Page 112, the text has been revised to read:

BIO-12. Implementation of the Preferred Restoration Alternative would result in Loss of Habitat for *Some Species of* Wintering Waterfowl

15. Page 113, the text has been revised to read:

Mitigation Measure BIO-14.1: Prevent Spread of Perennial Pepperweed to Uninfested Areas. A qualified botanist will conduct a non-native plant assessment of areas subject to construction activities including grading and earthwork. *The assessment will prioritize current and potential future invasive plant threats to the project.* Recommendations will be made to control the spread of non-native species. Measures ~~would may~~ include establishment of wash stations for construction vehicles and equipment to clean tires of weeds and other propagules before they enter and leave the Site and development of an herbicide spray program to destroy perennial pepperweed or other invasive infestations prior to construction.

Mitigation Measure BIO-14.2: Monitor the Cullinan Ranch Site for Infestation by Invasive Non-Native Plants. Areas disturbed by earthmoving equipment or grading will be monitored for infestation of perennial pepperweed or other potentially invasive species. All infestations occurring will be controlled and removed to the extent feasible without jeopardizing the establishment of any surrounding native plants. A long-term monitoring plan will be developed, subject to review and approval by the USFWS. *Early detection and rapid response protocols will be incorporated into the monitoring plan to reduce threats from invasive plants within and adjacent to the project site. The Refuge has an active tidal marsh invasive plant monitoring and control program. The program uses a circular plot method with a stratified random design developed by the National Institute of Invasive Species and USGS. The goal is to sample the plots at least once every five years. This program will be extended to the Cullinan Ranch project following project commencement. The priority control species at this time are perennial pepperweed (*Lepidium latifolium*) and non-native *Spartina* species.*

16. Page 114, the text has been revised and a new mitigation measure has been added:

BIO-16. Implementation of the Preferred Restoration Alternative will result in an Increase ~~of Breeding and Foraging in~~ Habitat for Salt-Marsh Dependent Special Status Species

Implementation of the Preferred Restoration Alternative will result in an increase of approximately 1,525 acres of tidal marsh habitat over the existing condition at the Cullinan Ranch Site. The tidal marsh habitat will be available to salt marsh dependent species including

the California clapper rail, black rail, salt marsh harvest mouse, San Pablo song sparrow, Suisun shrew, and plants such as soft bird's beak, Mason's lilaeopsis, and others. The tidal marsh habitat that will occur at the Cullinan Ranch Site will include tidal marsh vegetation, *high intertidal marsh*, meandering tidal sloughs, and upland refugia. The combination of these habitats in close proximity to each other will support many salt marsh-dependent wildlife and *special status* plant species in addition to the special status species mentioned above. Furthermore, restoration of tidal marsh habitat in the San Pablo Bay and San Francisco Bay regions is identified in the Ecosystem Goals Project and other planning documents as a favorable outcome. Anticipated increases in these habitats through restoration activities would result in a beneficial effect to special status species. ***Beneficial Impact.***

17. Page 115, the text has been revised to read:

BIO-19. Implementation of the Preferred Restoration Alternative would Result in Establishment of Upland-Wetland Transition Zones

The existing conditions at the Cullinan Ranch Site include levee slopes at a 3:1 horizontal to vertical ratio. The steep sides of existing levees at the Site are typical of the levees in the San Pablo Bay region. Steep levee slopes preclude development of a gradual upland to wetland transition that is more representative of natural conditions in tidal marshes. The gradual upland-wetland transition zone that occurs in natural settings provides important habitat for a variety of wildlife and plant species that can only occur in such habitats.

Under the Preferred Restoration Alternative, the construction of 10:1 levee slopes would be implemented in the discrete locations where levee buttressing is needed to protect the roadway from high tide events. This gradual levee slope ratio will increase the extent of the buffer area between the existing roadway and the tidal marsh. Levee side slopes along the Pond 1 levee will be increased to 7:1, which is slightly steeper. Sections of the Dutchman Slough levee will be lowered and flattened, which will allow tidal flows to overtop the levees under extreme high tide conditions. The gradual slopes of the Proposed Action will increase the total amount of upland-transition area *from 15 acres to approximately 30 acres that will be* available to salt marsh harvest mice and other species for use as upland refuge during extreme high tide events. This would likely result in fewer mortalities to individuals of the species, which may be forced onto the adjacent roadway or into predator habitat during high tide conditions. An increase in the amount of upland to wetland transition habitat will also result in an increase in suitable habitat for special status plant species including San Joaquin spearscale, and soft bird's-beak. These sites will be planted with native plants to augment natural recruitment into the area. The overall effects from increased upland habitat would constitute a beneficial effect.

18. Page 115, a mitigation measure for BIO-20 has been revised to read:

Mitigation Measure BIO-3.1: Remove Salt Marsh Harvest Mouse Habitat and Place Barrier Fencing.

~~Mitigation Measure BIO-3.2: Slow Flood-up of Cullinan Ranch.~~

19. Page 121, the text has been revised to read:

3.3 Hazardous Waste

This section addresses hazardous wastes at the Cullinan Ranch Site. The information provided in this section is based on the Cullinan Ranch Contaminant Sampling Report (CSR) prepared by Tetra Tech (November 2003) and *a report prepared by GeoEngineers (October 2006), which are* incorporated into this analysis by reference as Appendix D. The report presents the results of Tetra Tech's soil sampling investigations and analysis of contaminants discovered at the Cullinan Ranch Site. In 2006, removal and disposal of zinc contaminated soils was performed in a portion of the Site. The results of this clean-up effort are provided in *a the report prepared by GeoEngineers (October 2006) and incorporated into this analysis by reference as Appendix D.*

The Pole Barn area was remediated in 2006. Zinc concentrations that exceeded San Francisco Bay Ambient Sediment Concentrations and Effect Range - Median (ER-M) levels were identified and bounded to be within the roof drip-line of the Pole Barn on Cullinan Ranch. On July 19, 2006 and again on September 9, 2006, GeoEngineers directed the removal and disposal of a total of 50.69 tons of zinc-contaminated soil from the site. Excavated soils were disposed at Keller Canyon Landfill in Pittsburg, California. The results of confirmatory soil sampling indicate that the impacted site soils have been removed and no zinc contamination remains.

The Farmyard area was remediated in 2008. Nickel, DDT's and chlordane levels detected in the Farmyard area were also delineated and on August 6, 2008. Again, two clean up efforts were directed by GeoEngineers, resulting in the removal and disposal of more than 34.86 tons of contaminated soils. The soils were disposed at Keller Canyon Landfill in Pittsburg, California. The results of confirmatory soil sampling indicate that the soils contaminated with nickel, DDT's and chlordane have been removed from the site. GeoEngineers 2008 clean up report is documented in Appendix 3 of the Final EIS/R.

No other sites on Cullinan Ranch were identified as having soil contaminants on them.

20. Page 124, the text has been revised to read:

HAZ-1. Implementation of the No-Action Alternative would not result in Adverse Effects related to Hazardous Wastes

Under the No-Action Alternative, restoration of the Cullinan Ranch Site would not be undertaken by the lead agencies. Current levee maintenance work would continue on the Site; however, no other earth-moving activities would occur. As described above under "Affected Environment," some metals and pesticides were found during soil sampling conducted on the Site. Although the contaminant analysis revealed criteria exceedances, the various exceedances of contaminants were not found to be at levels that would directly result in a significant ecological risk to plant and wildlife populations inhabiting the Cullinan Ranch Site.

Furthermore, the USFWS is considering future remediation of the site. Remediation of all known contaminants was completed in 2008. Consequently, there would not be any adverse effects associated with hazardous wastes under the No-Action Alternative. **No impact.**

21. Page 132, the text has been revised to read:

LU-1. Implementation of the No-Action Alternative would not Result in Adverse Land Use, Recreation or Public Health Effects

As described in 2.0 Purpose and Need and Proposed Alternatives, the No-Action Alternative would not result in the restoration of Cullinan Ranch and the existing land use patterns would essentially remain unchanged. Use of the Cullinan Ranch Site for existing recreational activities, such as docent-led bird tours, may have to cease temporarily until proper reinforcements can be made to existing levees. These activities would be allowed once construction activities were completed. Furthermore, the existing seasonal wetland pools and drainage ditches that provide mosquito breeding habitat would remain, and mosquito control would continue to be implemented by the Solano Mosquito Abatement District. Consequently, implementation of the No-Action Alternative would not result in adverse land use, recreation or public health effects. No mitigation is required. ~~Less-than-significant impact.~~ **No impact.**

22. Page 136, the text has been revised to read:

LU-5. Implementation of the Preferred Restoration Alternative would Result in Reduction of Existing Mosquito Breeding Habitat due to Introduction of Tidal Influences onto the Cullinan Ranch Site

As described under “Existing Conditions,” the Cullinan Ranch Site currently stores large amounts of standing water that are breeding sites for mosquitoes. Mosquitoes can carry various diseases that may be passed on to humans leading to serious health effects and in some cases, mortality. Mosquitoes require standing water to complete their growth cycle. Any body of standing water represents a breeding site for mosquitoes, with the exception of ponded areas that are flushed by tidal action. These areas are not stagnant for a long enough period of time to support the mosquito larvae to maturity. Typically, greater numbers of mosquitoes are produced in water bodies with water levels that slowly increase or recede than in water bodies with rapidly fluctuating water levels. Permanent bodies of open water that have good circulation (i.e., tidal wetlands), low temperatures, and low organic content typically sustain stable nutrient content and support rich floral and faunal species diversity, including mosquito predators and pathogens. Additionally, wave action across large bodies of water physically retards mosquito production by inhibiting egg laying and larval survival (Jones & Stokes 2003). The Preferred Restoration Alternative would result in opening of the existing Cullinan Ranch Site to tidal influences of the Napa River. Initially, tidal action on the Cullinan Ranch Site will result in the slow circulation of water, but over time as the tidal wave actions reach equilibrium, the Cullinan Ranch Site will become an open water body that exhibits the mosquito-limiting characteristics described above.

Both the Solano and Napa Mosquito Abatement Districts (MADs) would be consulted during design, construction, and operation phases of the Preferred Restoration Alternative regarding mosquito abatement control measures for the Cullinan Ranch Site. Consultation may include:

- o Development and implementation of strategies to minimize potential mosquito breeding habitats during initial phases of restoration;*
- o Use of appropriate biological and/or chemical USFWS and EPA-approved pesticides; and*
- o Consultation with the MADs to perform continuous monitoring of larval and adult mosquito populations, water quality, and vegetation density and to implement management measures in accordance with the MADs procedures and programs.*

Overall, a decrease in mosquito producing habitats would likely occur with implementation of the Preferred Restoration Alternative., ~~however the following mitigation measure is recommended to ensure that proper mosquito abatement procedures are implemented~~

~~throughout construction and implementation of the Proposed Action. Less than Significant impact, with implementation of mitigation. Beneficial Impact.~~

~~**Mitigation Measure LU-5.1: Coordinate with Local Mosquito Abatement Districts during Project Design, Construction and Operation.** Although mitigation is not required, the USFWS shall consult with both the Solano and Napa Mosquito Abatement Districts (MADs) during design, implementation and operation phases of the Preferred Restoration Alternative regarding mosquito abatement control measures for the Cullinan Ranch Site. Consultation shall include:~~

- ~~○ Development and implementation of strategies to minimize potential mosquito breeding habitats during initial phases of restoration;~~
- ~~○ Use of appropriate biological and/or chemical USFWS and EPA approved pesticides; and~~
- ~~○ Consultation with the MADs to perform continuous monitoring of larval and adult mosquito populations, water quality, and vegetation density and to implement management measures in accordance with the MADs procedures and programs.~~

23. Page 138, the text has been revised to read:

LU-8. Implementation of the Partial Restoration Alternative would Result in Reduction of Existing Mosquito Breeding Habitat due to Introduction of Tidal Influences onto a Portion of the Cullinan Ranch Site

~~As described under “Existing Conditions,” the Cullinan Ranch Site currently stores large amounts of standing water that are breeding sites for mosquitoes. The Partial Restoration Alternative would result in opening part of the existing Cullinan Ranch Site to tidal influences of the Napa River. Standing water areas may still occur where there are no changes to the site. The USFWS will consult with both the Solano and Napa Mosquito Abatement Districts (MADs) during design, construction, and operation phases of the Partial Restoration Alternative regarding mosquito abatement control measures for the Cullinan Ranch Site. Consultation may include:~~

- ~~○ Development and implementation of strategies to minimize potential mosquito breeding habitats during initial phases of restoration;~~
- ~~○ Use of appropriate biological and/or chemical USFWS and EPA-approved pesticides; and~~
- ~~○ Consultation with the MADs to perform continuous monitoring of larval and adult mosquito populations, water quality, and vegetation density and to implement management measures in accordance with the MADs procedures and programs.~~

Overall, a decrease in mosquito producing habitats would likely occur with implementation of the Partial Restoration Alternative., ~~however the following mitigation measure is recommended to ensure that proper mosquito abatement procedures are implemented throughout construction and implementation of the alternative. Less than Significant impact, with implementation of mitigation. Beneficial Impact.~~

~~**Mitigation Measure LU-5.1: Coordinate with Local Mosquito Abatement Districts during Project Design, Construction and Operation.**~~

24. Page 142, the text has been revised to read:

VQ-2. Implementation of the Preferred Restoration Alternative would not Substantially Affect a Scenic Vista or Degrade the Existing Visual Character of the Site and its Surroundings

Implementation of the Preferred Restoration Alternative would result in the transformation of the Cullinan Ranch Site from primarily seasonal wetlands to tidal marshes. During construction activities, construction crews would be operating several trucks and other construction equipment on the Site to unload off-site material, construct PG&E boardwalks, complete levee reinforcements, excavate and block drainage ditches, repair and enhance the Pond 1 levee, construct kayak access within the Cullinan Ranch Site, and install interpretive signs. Use of construction vehicles and equipment on the Cullinan Ranch Site would constitute a change in the existing visual character of the Site. However, the construction activities on the Site would be temporary and construction vehicles and equipment would be permanently removed from the Site once construction activities were completed. Once construction activities were completed and the proposed breaches were implemented, Cullinan Ranch would be opened up to the tidal influences of adjacent waters constituting a change in the overall landscape of the Site. With this change in landscape, over time Cullinan Ranch would no longer exhibit the characteristics of a seasonal wetland area since tidal waters would flood the Site and its upland grasslands, shrubbery and trees would be underwater. Cullinan Ranch would instead exhibit characteristics of an open water body similar to the adjacent Ponds 1, 1A, 2, 2A, and 3. Although this change in habitat would alter the existing visual features of the Site, restoration of the Site from its current state to its near-historic condition as a tidal marsh would not adversely affect the overall visual character of the Site or its surrounding area. Once construction activities are completed, viewer groups would view the Site in the same manner as existing views and the change in visual landscape would not lower the relative sensitivity of each viewer group since the Site would generally remain as an open space natural habitat area. *The project will create views consistent with views of the surrounding area including open water, mudflats and tidal marshlands. Appendix 2 of the FEIS/R provides the projected views of the Site during the transition to a tidal marsh.* Furthermore, implementation of the Preferred Restoration Alternative would be consistent with the policies of the *Scenic Roadways Element* of the Solano County General Plan as listed above. As a result, implementation of the Preferred Restoration Alternative would not result in adverse effects on visual quality. ***Less-than-Significant impact.***

25. Page 146, the text has been revised to read:

TR-2. Implementation of the Preferred Restoration Alternative could Diminish Overall Traffic Operations along Highway 37 or its Approaches during Importing Operations

Proposed improvements to the Pond 1 and Highway 37 levees could require approximately 14,900 truck trips to and from the Site for the importing of off-site fill material. *The 2800 cy of clean soil to cover riprap along Highway 37 above 7.0 feet NGVD would come from an on-site borrow source and would not require additional truck trips. Clean soil for the potential 50-acre tidal marsh would either be pumped from a nearby source or barged to the site. It would be offloaded directly to the site and therefore would not require any additional truck trips.*

Introduction of approximately 14,900 new truck trips to Highway 37 both at the western access point at Pond 1 and at the Mare Island approach could lead to slowing of traffic on the Highway 37 corridor. As described under “Existing Conditions,” existing traffic volumes in the eastbound direction typically increase during peak-hours where the LOS is D for various sections of the highway, particularly between the Napa River Bridge and the intersection of Highway 37 and State Route 29 within Vallejo. Although the importing operation would be short-term, and introduction of approximately 14,900 truck trips onto the roadway would not by itself substantially increase traffic volumes, the addition of slow-moving trucks to this segment of roadway during peak-hours would result in overall diminished operations of the roadway.

26. Page 147, the text has been revised to read:

Mitigation Measure TR-32.1: Develop and Implement a Traffic Control Plan in Coordination with Caltrans.

27. Page 147, this same text occurs a second time on this page and has been revised to read:

Mitigation Measure TR-32.1: Develop and Implement a Traffic Control Plan in Coordination with Caltrans.

28. Page 148, the text has been revised to read:

TR-4. Implementation of the Partial Restoration Alternative could Diminish Overall Traffic Operations along Highway 37 or its Approaches during Importing Operations

Under the Partial Restoration Alternative proposed improvements to the eastern portion of the Highway 37 levee and construction of the internal levee could require approximately 13,200 truck trips to and from the Site for the importing of off-site fill material. Introduction of approximately 13,200 new truck to Highway 37 at the Mare Island approach could lead to slowing of traffic within the Highway 37 corridor. As described under “Existing Conditions,” existing traffic volumes in the eastbound direction typically increase during peak-hours where the *Level of Service LOS* is D *on an A-F scale* for various sections of the highway, particularly between the Napa River Bridge and the intersection of Highway 37 and State Route 29 within Vallejo. Although the importing operation would be short-term, and introduction of 13,200 truck trips onto the roadway would not significantly increase traffic volumes, the addition of any slow-moving trucks to this segment of the roadway during peak-hours would result in overall diminished operations of the roadway.

29. Page 148, the text has been revised to read:

Mitigation Measure TR-32.1: Develop and Implement a Traffic Control Plan in Coordination with Caltrans.

30. Page 152, the text has been revised to read:

Mitigation Measure N-2.1: Conduct Noise Monitoring and Implement Noise Reducing Construction Practices If Needed. In order to reduce noise levels during

construction activities, the construction contractor shall implement, but not exclusively, the following noise-reduction practices, *if needed*.

31. Page 153, the text has been revised to read:

Mitigation Measure N-2.1: Conduct Noise Monitoring and Implement Noise Reducing Construction Practices *If Needed*.

32. Page 163, the text for the Preferred Restoration Alternative has been revised to read:

AQ-3. Implementation of the Preferred Restoration Alternative would Result in *Minimal* Emissions of Ozone Precursors from Construction Activity

Use of *medium and* heavy-duty construction equipment during restoration activities would result in the temporary release of ozone precursors through vehicle exhaust. The emissions estimates prepared for the Preferred Restoration Alternative show that *approximately 5.0 up to 21* tons per year of *nitrous oxides* ~~NO_x~~ and *0.5 4.0* tons per year of ROG would be generated during construction activities. These estimates ~~do not exceed the existing BAAQMD~~ *are below the* conformity thresholds of *50 and* 100 tons per year *each of* *nitrous oxides* ~~NO_x~~ or ROG, respectively. ~~Furthermore, the predicted emissions are less than 10% of the total SFBAAB's typical emissions for these pollutants.~~ Due to the temporary nature of construction activities, and because construction activities would be carried out in accordance with BAAQMD ~~standards~~ *BMPs for PM₁₀*, there would not be a significant adverse air quality effect *under CEQA. Less-than-Significant impact, with implementation of mitigation.*

Mitigation Measure AQ-3.1: Implement BMPs to Ensure Ozone Precursor Emissions are minimized. *To ensure minimization of ozone precursor emissions, the following BMPs will be implemented. Prior to construction on the Cullinan project, an inventory of all equipment will be conducted and the suitability of add-on emission controls for each piece of equipment will be identified before ground breaking. The newest, cleanest equipment available meeting the most stringent of applicable or Federal or State Standards will be used to the extent feasible based on equipment availability and in accordance with federal regulations. All engines will be maintained and tuned according to manufacturer's specifications to perform at EPA certification levels. Periodic, unscheduled inspections will be conducted to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with the established specifications. EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site will be utilized.*

33. Page 164, the text for the partial restoration alternative has been revised to read:

AQ-5. Implementation of the Partial Restoration Alternative would Result in Minimal Emissions of Ozone Precursors from Construction Activity

As described above, use of *medium and* heavy-duty construction equipment during restoration activities would result in the temporary release of ozone precursors through vehicle exhaust. The emissions estimates prepared for the Partial Restoration Alternative show that *approximately 3.9 up to 19.9* tons per year of *nitrous oxides* ~~NO_x~~ and *0.4 3.9* tons per year of ROG would be

generated during construction activities. These estimates ~~do not exceed the existing BAAQMD~~ are below the conformity thresholds of 50 and 100 tons per year each of ~~nitrous oxides~~ NO_x or ROG_s, respectively. ~~Furthermore, the predicted emissions are less than 10% of the total SFBAAB's typical emissions for these pollutants.~~ Due to the temporary nature of construction activities, and because construction activities would be carried out in accordance with BAAQMD ~~standards~~ BMPs for PM₁₀, there would not be a significant adverse air quality effect under CEQA. **Less-than-Significant impact, with implementation of mitigation.**

Mitigation Measure AQ-3.1: Implement BMPs to Ensure Ozone Precursor Emissions are minimized.

34. Page 172, the text has been revised to read:

Mitigation Measure CR-3.1: If previously unknown subsurface historic or archaeological artifacts are encountered during ~~deep earth moving~~ construction activities, ~~all work within 50 feet of that Area or that would affect that Area~~ shall halt and the San Pablo Bay National Wildlife Refuge manager shall be immediately notified. A regional archaeologist or similarly qualified individual (under the approval of the USFWS) shall assess the deposits before work resumes in the discovery area. ~~In addition to notifying the USFWS regional archaeologist, the refuge manager will also inform the specified cultural resources contact at Caltrans if archaeological/cultural resources are encountered within the Caltrans right of way. If unanticipated human remains are encountered during construction, a Native American Tribal representative and the County coroner shall be informed and consulted as required by State law. Prior to the start of work, site supervisors and workers job site training to assist them in identifying historic or archeological artifacts.~~

35. Page 172, the text has been revised to read:

CR-4. Implementation of the Preferred Restoration Alternative would not Result in Adverse Effects to Significant Cultural Resources

~~As described under "Existing Conditions," the Cullinan Ranch Site is property and identified resources on the property are ineligible for inclusion on the NRHP. The property has no strong associations with significant historical events or persons, nor are any of its structures and levees architecturally significant or outstanding examples of structural engineering. In addition, Cullinan Ranch no longer exhibits historical integrity due to the earlier losses of the main ranch house and other structures. Therefore, implementation of the Partial Restoration Alternative would not result in adverse effects to significant cultural resources at the Cullinan Ranch Site. No impact.~~

CR-5. Implementation of the Partial Restoration Alternative could Potentially Affect Subsurface Historic or Archaeological Artifacts

~~Proposed earth moving activities such as dredging and excavating could result in the inadvertent discovery of significant subsurface deposits of historic or archaeological artifacts at the Cullinan Ranch Site, which could be disturbed by construction activities. This is considered an adverse effect. Implementation of the following mitigation would minimize this effect. Less-than-significant impact, with implementation of mitigation.~~

Mitigation Measure CR-3.1: *If Unanticipated Historic or Archeological Artifacts are Encountered during Construction, All work within 50 feet of that Area or that would Effect that Area Should Stop Until an Archeological Consultant Assesses the Artifacts. If unanticipated Human Remains are Encountered During Construction, a Native American Tribal Representative and the County Coroner shall be Informed and Consulted as Required by State law.*

Clarifications and Changes to Chapters 4, and 5

There are no changes to these chapters.

Clarifications and Changes to Chapters 6

1. Page 180, a reference has been added:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

2. Page 182, a reference has been added:

National Institute of Invasive Species Science. 2005.
<http://www.niiss.org/cwis438/websites/niiss/home.php?WebSiteID=1>

Clarifications and Changes to Chapter 7, Appendix A

1. Page 196, the text has been revised to read:

3. **Site Hydrology:** Once the levee is breached, low site elevations will create a large basin, which will substantially increase the tidal prism of Dutchman and South Sloughs. The increased prism and resultant higher tidal currents may result in channel erosion and loss of fringe marshes in the slough system. ~~Pritchard~~ ~~Pritchett~~ Marsh, which is located on the south bank of Dutchman Slough near its mouth, may also see erosion due to the combined effect of the Ranch and Pond 3 restoration projects. The potential for release of contaminants from ~~Pritchard~~ ~~Pritchett~~ Marsh may be a concern, which would have to be addresses.

2. Page 205, the text has been revised to read:

Case 2b – Similar To Case 2, But With A Larger Entrance Channel Through Pond 3

An additional restoration option was simulated using a bypass channel through Pond 3, along the north side of Dutchman Slough, which would effectively connect the lower portion of the Ranch site to Napa River (see Figure 3.3-2). The assumption was that a new levee channel would be built in the lower portion of Pond 3 (note that this option assumes the Ranch site would be restored prior to Pond 3), with the primary objective being reducing the erosion potential for ~~Pritchard~~ ~~Pritchett~~ Marsh. The channel was assumed to be about 450 ft wide, which is about the

width of Dutchman Slough, and a depth of 3.5 feet below NGVD was used in the model. This option would also eliminate the need for significant levee maintenance of the Pond 3 levee at the channel bend where Dutchman Slough turns south (see Figure 3.3-2).

Simulation results indicate that tidal damping near the first breach (near Guadalcanal) will be less than 1 foot. The Ranch will still experience a spring tide range less than 4.5 feet, compared to 6.3 feet in Napa River, which is about 30% damping. Peak velocities are about 60% smaller than the unmitigated case (Case 2 above), but still higher than existing velocities.

Calculations indicate that to maintain velocities at the mouth of Dutchman close to existing values, the bypass channel would have to be deepened to about 15 feet below NGVD. With this channel, tidal flow through Dutchman Slough would remain about the same and the cross section would not change, which would reduce the potential for erosion in the ~~Pritchard~~ Pritchett Marsh area. Deepening the bypass channel to 15 feet below NGVD would represent more than 2 times the present channel cross sectional area near the mouth of Dutchman Slough, yet it would not eliminate damping within Cullinan Ranch. Although it relieves the erosion potential for ~~Pritchard~~ Pritchett Marsh, the high construction costs for this alternative (dredging and levee improvements) do not make it a very attractive option.

An alternative could be widening the mouth of Dutchman Slough, but this was not deemed to be an attractive option either because the shape of the new equilibrium channel would not eliminate the erosion potential at ~~Pritchard~~ Pritchett Marsh. Also, the sections of levees near the channel bends would continue to experience significant bank erosion, requiring continued maintenance at a high cost.

3. Page 207, the text has been revised to read:

5.1.3 CASE 3 :- FULL RESTORATION, LIMIT NUMBER OF BREACHES, PRE POND 3 CONSTRUCTION

The objective of this option was to keep most of the restoration related effects to the western portion of the study area. The option assumes 2 breaches along the western portion of the site. This would potentially accomplish 3 purposes:

- reduce effects on ~~Pritchard~~ Pritchett Marsh,
- eliminate need for levee maintenance in this area, and
- restore the use of South Slough as the dominant tidal channel in the study area

and the last paragraph has been revised to read:

Results indicate that this option will potentially re-establish South Slough as the dominant channel in the project area, but it does not reduce the potential for erosion near ~~Pritchard~~ Pritchett Marsh. Levee improvements along most of Dutchman Slough will need to be constructed because of increased velocities, and maintained until breaches can be constructed along the eastern portion of the site.

4. Page 219, the text has been revised to read:

The required channel sectional areas for the tidal range described above (based on empirical relationships between tidal prism and channel geometry) are also presented in Table 5.1-8. The

relationships indicate that the mouth of Dutchman Slough should be about 2.4 times larger than existing conditions, and the middle portion should be about 25% smaller. If a bypass channel through Pond 3 (similar to that of Case 2a) were added to this alternative, peak velocities through Dutchman Slough would decrease and the potential erosion at ~~Pritchard~~ Pritchett Marsh may be reduced. However, this would require coordination with the Pond 3 restoration project, which is further along in its planning process, and potential re-evaluation of the Pond 3 preferred alternative.

5. Page 221, the text has been revised to read:

The table also shows the equilibrium dimensions of the channel with the increased tidal prism for Case 8 (Full restoration, fully integrated with Pond 3). The equilibrium width would be about 60% more than the existing channel width at MHHW, the channel would be deeper by about 3.3 ft, and the cross-sectional area would increase to approximately 2.3 times that for existing conditions. This indicates that natural channel widening may involve not just erosion of vegetated marsh, but also of levees, on one and/or both sides of the channel. Part of the ~~Pritchard~~ Pritchett Marsh, and levees along Guadalcanal Village wetland and Pond 3 could see erosion.

6. Page 227, the text has been revised to read:

Erosion along the banks of both sloughs will mostly likely occur for all the Full Restoration options. Along Dutchman Slough this may present problems in the lower reach near the mouth, where other properties may be affected including Guadalcanal Village, Pritchard Marsh and the Pond 3 levees. However, if Pond 3 is restored, erosion of its levees will not be a concern. Some of the low marsh habitat within Guadalcanal, along with sections of the old perimeter levee, may be eroded. There is a high probability that portions of ~~Pritchard~~ Pritchett Marsh, because of its proximity to both restoration projects and the increase in velocities in Dutchman Slough, will erode along the slough and along Napa River. This may need to be mitigated by installing protective measures such as sheet piles or other forms of bank protection along the affected areas.

Clarifications and Changes to Chapter 8, Appendix B

1. Page 285, second to last paragraph of USFWS letter dated May 31, 2007 states that “we recommend that you get an updated list every 90 days”. To reflect the updated list, the text on pages 286 and 287 has been revised to read:

Document Number: ~~070531013620~~ 090409111722

Database Last Updated: ~~March 5, 2007~~ January 29, 2009

Birds

- Charadrius alexandrinus nivosus
 - western snowy plover (T)

- ~~Haliaeetus leucocephalus~~
 - ~~bald eagle (T)~~

Fish

- Oncorhynchus tshawytscha
 - Central Valley fall/late fall-run Chinook salmon (C) (NMFS)
 - Critical habitat, Central Valle fall/late fall-run Chinook (C) (NMFS)